



# Metaglas<sup>®</sup>

**Mechanically Prestressed Sight Glass**

## **Installation / Operation / Maintenance Manual**

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## **1.00 Warranty**

L. J. Star warrants Metaglas against defects in material and workmanship for a period of eighteen months from the date of shipment. L. J. Star will, at its option, repair or replace those products that fail to perform as specified with the following exceptions. This warranty does not apply to glass breakage or any other liability other than materials and workmanship.

### **1.10 Exceptions**

Products repaired or modified by persons not authorized by L. J. Star.

Products subject to misuse, negligence or accidents.

Products that are connected, installed or otherwise used in a manner not in accordance with the manufactures instructions.

### **1.20 Provisions**

L. J. Star's responsibility hereunder is limited to repairing or replacing the product at its expense. L. J. Star shall not be liable for loss, damage or expense directly or indirectly related to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that L. J. Star is not responsible for damage or injury caused to other products, building, property or persons by reason of the installation or use of its products.

This warranty is in lieu of any other warranty expressed or implied by any party other than L. J. Star. Repairs and/or replacements shall be at the sole discretion of L. J. Star based upon the terms and conditions.

## **2.00 Introduction**

Metaglas is mechanically prestressed borosilicate glass fused within a dimensionally adapted metal ring.

### **2.10 Product Description**

The two components are fused by first melting borosilicate glass inside the metal ring. They are then cooled under tightly controlled conditions. The result is the formation of a permanent bond between the glass and metal.

The difference in the linear coefficient of thermal expansion between the glass and metal creates a mechanically induced uniform compressive stress throughout the solid glass disc. Because the glass prevents the ring from shrinking to its theoretical size, the ring remains in tension providing a constant and homogeneous compressive strain throughout the cross section of the glass.

## 2.20 Benefits

As a result of its unique construction, Metaglas nearly eliminates the possibility of catastrophic failure due to glass damage.

Metaglas is much more resistant to impact and over-pressurization than standard borosilicate glass or tempered borosilicate glass.

Metaglas can be safely removed from and reused in the same service repeatedly.

Metaglas is unaffected by excess torque applied to cover bolts or studs.

## 3.00 Installation

### 3.10 Unpacking

Upon receipt of your Metaglas, check it carefully for damage incurred during shipment. If damage is evident or suspected, do not attempt installation. Notify the carrier immediately and request a damage inspection. Check each item against the packing list.

### 3.20 Mounting

Metaglas discs should be mounted on a recessed, flat-faced flange or raised face flange surface. An appropriate sealing material in the form of a gasket or O-ring should be present between the disc and mounting surface. The choice of gasket or O-ring material is typically dictated by the process service.

Follow good torque procedures when tightening the bolts or studs. Required torque values will vary with the gasket or O-ring material of construction.

## 4.00 Maintenance

Metaglas is designed to provide a long service life compared to conventional sight glasses. However, sound maintenance practices require periodic inspection to insure your disc is free from damage and in good working condition. The end user must determine the appropriate maintenance schedule based upon their experience with the specific application. Realistic maintenance schedules can only be determined with full knowledge of the service and applications involved.

### **WARNING**

**Do not proceed with any maintenance if the Metaglas disc is still at operating pressure or temperature. Relieve the unit of pressure or vacuum, allow it to reach ambient temperature and purge or drain it of all fluids. Failure to do so could result in personal injury or property damage.**

The use of personal safety apparatus when viewing the process or during maintenance is highly recommended. This includes but is not limited to eye and skin protection.

## 5.00 Troubleshooting

### 5.10 Cracked Glass

Metaglas is **not** immune to surface cracking. However, unlike conventional sight glass, cracks that are concentric or are close to the glass to metal interface **do not** necessarily represent a risk to personnel or your service. Metaglas can operate safely in this condition without experiencing catastrophic failure for extended periods.

Cracks on the process side of the disc may introduce glass into your fluid. If this is not acceptable, the disc should be replaced immediately.

Should you discover a surface crack in your Metaglas, monitor it regularly. If the crack is stable the unit should provide adequate service until the next scheduled maintenance period. If the crack increases in size or depth, the disc should be replaced immediately.

### 5.20 Sources of Cracked Metaglas

Cracks in your Metaglas are representational of excess mechanical or thermal stress being applied to the disc. Check your service or application for one or more of the following conditions should cracks in your Metaglas appear.

#### Thermal Shock

Is the sight glass subjected to rapid temperature gradients? This includes a rapid increase or decrease in operating temperature, sterilization or steam cleaning.

#### Chemical Erosion

Metaglas is unique in its safety characteristics. However, one of its main components is borosilicate glass. Consequently, it is subject to the same erosion concerns as conventional sight glasses. Steam can also erode or etch glass.

#### Mechanical Shock

This includes heavy vibration or direct impact. Check both the process and the external environment for potential sources of either condition.

#### Mechanical Stress

Loads caused by improper mounting of or excess bending moment applied to the sight glass. They can be linked to improper alignment of the sight glass in the port, an uneven mounting surface or debris trapped under the sight glass.